Right Abutment Seepage

Lowering Risk During Construction

In March of 2005 the Corps modified the lake operation with the aim of reducing high lake levels typically experienced in the winter and spring months to help take some stress off the foundation. This modified operation reflects a compromise between the need to lessen stress on the foundation and the needs of customers who benefit from the dam. We are considering other measures, including further lake level reductions and enhanced emergency action plans to reduce the risk while maintaining project functions. Impacts to those upstream who depend on the lake will be considered as well as the risk and potential impacts to those downstream. District personnel are closely monitoring the dam every day of the week. We have identified a number of distress indicators that would prompt an immediate emergency drawdown of the lake; however such an emergency condition is not anticipated.

We will inform all Center Hill stakeholders and the public of rehabilitation plans and any modified lake operations by means of news announcements and public meetings beginning in the fall of 2006. You may access the Corps website for project updates at: *http://www.lrn.usace.army.mil/pao/issues/CENcommo* You may use search programs and the key words: Center Hill Seepage or Nashville District.

What Can You Do?

If you live near the Cumberland River or a major tributary, check if your property is within a designated dam failure flooded area. The maps will be available this spring at your County Emergency Management office, the Corps' offices and at many public libraries as listed on our website. If you are in or near a designated flood area, you may:

- Purchase a weather band radio for early warning
- Have a plan for evacuation of your family to a designated gathering place
- Practice your evacuation plan
- Secure your property by locking doors and out buildings upon departure
- Establish a contact person or persons outside the flooded area for check-in
- Consider purchasing flood insurance (strictly a personal choice)

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Nashville District

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Center Hill Dam

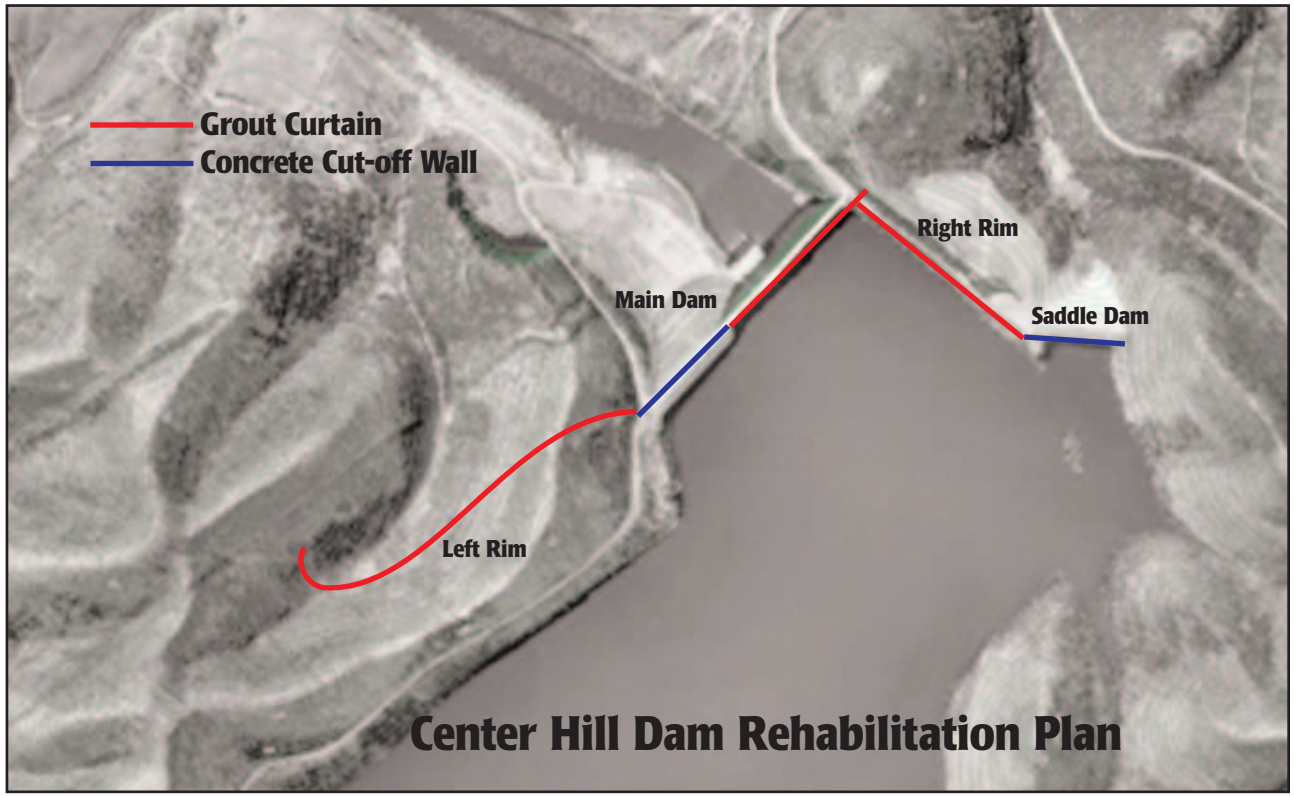
Center Hill Dam is located at Mile 26.6 on the Caney Fork River, a major tributary to the Cumberland River. The Center Hill project has been in service for 55 years (1951-2006) providing important benefits of flood control, hydropower, recreation, water supply and water quality. Center Hill Lake is impounded by the dam and was designed to hold up to 2,092,000 acre-feet at its maximum flood control pool elevation of 685. (An acre-foot is a volume that is 1 acre large and 1 foot deep.) Center Hill Dam has a maximum height of 250 feet above founding level. The main dam consists of a 1,382 foot long concrete section and a 778 foot long rolled earth embankment. A 125 foot high earthen saddle dam 770 feet long is placed in a low area in the right rim. A three-generator-unit power plant and switchyard are located immediately downstream. TN State Highway 96 runs across the top of the dam.

Center Hill Foundation and Rim Seepage

Seepage Problems

The dam was designed and built in the 1940's in a karst limestone foundation that is prone to seepage. Seepage is the movement of water through and under a dam. All dams have some seepage as the impounded water seeks paths of least resistance through the dam and its foundation. Seepage must, however, be controlled in both velocity and quantity to keep the dam safe. Original designers recognized the nature of the rock and the potential for seepage through the relatively thin rim sections and acknowledged that maintenance would be required to keep the dam safe. We have closely monitored seepage since the 1960's and have completed several limited grouting programs in attempt to slow and control the seepage. Grout is a mixture of sand, cement and water that can be placed into drilled holes into the foundation soil and rock to close any openings.

Foundation conditions continue to slowly worsen because clay-filled joints are eroding in the rock within the rims and dam foundation. If untreated, this erosion would eventually jeopardize the two earthen embankments (main dam and saddle dam) and the integrity of the rims. The Nashville District of the Corps of Engineers has recently received Washington approval to begin a major rehabilitation project to ensure the long-term safety of the dam.



Fixing The Dam

The approved rehabilitation plan includes modern concrete cut-off walls constructed within the entire length of the main dam and saddle dam embankments. These walls will extend deep into the rock foundation to effectively "cut-off" seepage through the embankments and therefore protect the earthen portion of the dams from internal erosion. The approved plan also includes placing balanced stabilized grout (durable and long-lasting grout) beneath the entire dam and along both sides of the dam.

Fish depend on continuous cold water seepage has historically provided. We plan to replace cold seepage downstream by replacing a small undependable hydropower unit in the powerhouse. The existing 55-year unit was intended to provide back-up power to start the larger turbines. It will be replaced by a new 2 megawatt unit that will produce hydropower and provide the optimal minimum flow downstream.

The total estimated cost of the rehabilitation plan is $220 million. The entire rehabilitation will take 5-8 years to complete.

Plans to accelerate the work are being considered. Ongoing work includes design and site work. Drilling into the dam foundation for rock information began in late November. Initial grouting is planned to begin in the summer of 2007. This grout will make the dam safer by filling voids within the foundation. Cut-off wall construction will follow the grouting and is anticipated to begin in 2009.